AMENDMENTS TO THE CLAIMS

Complete listing of the claims.

We claim:

1. (Original) A method of performing a signal enhancement operation on a digital input signal to produce a best estimate of a true signal which the digital input signal is assumed to represent, comprising:

a) deriving a plurality of candidate mappings, each candidate mapping defining a mapping between the signal domain of the digital input signal and an alternative optimisation domain, each signal in the signal domain corresponding to a set of optimisation parameters in the optimisation domain;

b) for each candidate mapping, calculating an indicator of the quality of the candidate mapping and generating a set of optimisation parameters in the optimisation domain of the candidate mapping, the set of optimisation parameters representing an enhanced signal in that domain;

c) selecting the highest-quality mapping in dependence on the calculated indicators;

d) selecting the set of optimisation parameters generated for the selected mapping in step b); and

e) applying the selected mapping to the selected set of optimisation parameters to produce an enhanced digital signal in the signal domain.

2. (Currently Amended) A method according to ~~Claim~~ claim 1, wherein calculation of the quality indicator is dependent on the generation of the set of optimisation parameters representing an enhanced signal.

3. (Currently Amended) A method according to ~~Claims~~ claim 1 ~~or 2~~, wherein generating a set of optimisation parameters representing an enhanced signal in the optimisation domain of a given candidate mapping comprises performing a search through the space of possible sets of optimisation parameters in that domain.

4. (Currently Amended) A method according to ~~Claim~~ claim 3, wherein performing a search comprises optimising the set of optimisation parameters with

respect to a quality measure indicating the quality of an enhanced signal represented by any given set of optimisation parameters.

5.　　(Currently Amended)　A method according to ~~Claim~~ claim 4, wherein the quality measure comprises a measure of the probability that a given set of optimisation parameters represents, in the optimisation domain, the true signal.

6.　　(Currently Amended)　A method according to ~~Claims 3-5~~ claim 3, wherein the search is performed in accordance with a numerical optimisation algorithm.

7.　　(Currently Amended)　A method according to ~~any one of the preceeding claims~~ claim 1, wherein calculating an indicator of the quality of a candidate mapping comprises analysing a probability distribution of the probabilities that given sets of optimisation parameters in the optimisation domain of the candidate mapping represent the true signal.

8.　　(Currently Amended)　A method according to ~~any one of the preceeding claims~~ claim 1, wherein generating a set of optimisation parameters representing an enhanced signal comprises calculating at least an estimate of the set of optimisation parameters having the highest probability of representing, in the optimisation domain of the candidate mapping, the true signal.

9.　　(Currently Amended)　A method according to ~~any one of the preceeding claims~~ claim 1, wherein calculating a quality indicator comprises calculating a Bayesian evidence function.

10.　　(Original)　A method of processing a digital input signal, comprising the steps of:

selecting a mapping between the signal domain of the digital input signal and an alternative optimisation domain in dependence on the digital input signal;

deriving an alternative signal representation from the digital input signal using the selected mapping; and

performing a signal processing operation on the alternative signal representation;

and wherein the mapping is selected from a plurality of candidate mappings by evaluating a Bayesian evidence function which provides an indication of the quality of a given candidate mapping.

11.   (Currently Amended)   A method according to ~~Claims 9 or~~ claim 10, wherein the Bayesian evidence function at least estimates the Bayesian evidence of the digital input signal given a particular candidate mapping.

12.   (Currently Amended)   A method according to ~~Claim~~ claim 11, wherein each signal in the signal domain corresponds to a set of optimisation parameters in the optimisation domain, and wherein the Bayesian evidence function estimates or calculates the Bayesian evidence using:

a likelihood function describing the probability of obtaining the digital input signal given any particular set of values for the optimisation parameters, given the particular candidate mapping; and

a prior probability function describing the prior probability of the occurrence of any particular set of values for the optimisation parameters, given the particular candidate mapping; the prior probability function codifying prior knowledge of the distribution of values for the optimisation parameters in advance of analysis of the digital input signal.

13.   (Currently Amended)   A method according to ~~Claim~~ claim 12, wherein the Bayesian evidence function estimates or calculates the Bayesian evidence by estimating or calculating the integral of the product of the likelihood function and the prior probability function over all sets of optimisation parameters in the optimisation domain of the candidate mapping.

14.   (Currently Amended)   A method according to ~~any one of the preceeding claims~~ claim 1, wherein the plurality of candidate mappings are defined by a set of one or more mapping parameters; and wherein the mapping is selected by optimising the quality indicator or the Bayesian evidence function as a function of the mapping parameters.

15.   (Currently Amended)   A method according to ~~Claim~~ claim 14, wherein the mapping parameters are discrete and act as labels for a set of pre-defined mappings.

16.   (Currently Amended)   A method according to ~~any one of the preceeding claims~~ claim 1, wherein the candidate mappings are defined by a continuously parameterisable mapping function.

17.   (Currently Amended)   A method according to ~~any one of the preceeding claims~~ claim 1, wherein the mapping is selected in dynamic dependence on the signal.

18.   (Currently Amended)   A method according to ~~any one of the preceeding claims~~ claim 1, wherein the digital input signal is an image or a portion of an image, and wherein the mapping is selected in dependence on the image or the portion.

19.   (Currently Amended)   A method according to ~~any one of the preceeding claims~~ claim 1, wherein the candidate mappings are general non-linear functions.

20.   (Currently Amended)   A method according to ~~any one of the preceeding claims~~ claim 1, wherein the candidate mappings are linear functions.

21.   (Currently Amended)   A method according to ~~any one of the preceeding claims~~ claim 1, wherein optimisation parameters in the optimisation domain are selected from the group consisting of coefficients of sinusoidal functions; coefficients of wavelet functions; coefficients of Gaussian functions; coefficients of top-hat functions; coefficients of signal-to-noise eigenfunctions of the input signal; and coefficients of continuous parameterisable functions that vary continuously between two or more standard forms.

22.   (Currently Amended)   A method according to ~~any one of the preceeding claims~~ claim 1, wherein the signal processing or enhancement operation is selected from the group consisting of sharpening; noise reduction; tone scale adjustment; intensity balance adjustment; colour balance adjustment; colour re-mapping; de-blocking; and image magnification employing interpolation.

23.   (Original)   Digital signal processing apparatus for processing a digital input signal, comprising:

     means for selecting a mapping between the signal domain of the digital input signal and an alternative optimisation domain in dependence on the digital input signal;

     means for deriving an alternative signal representation from the digital input signal using the selected mapping; and

     means for performing a signal processing operation on the alternative signal representation;

     wherein the selecting means is adapted to select the mapping from a plurality of candidate mappings using a mapping quality function which provides an indication of the quality of a given candidate mapping;

     wherein the plurality of candidate mappings are defined by a continuously parameterisable mapping function of a set of one or more mapping parameters; and

     wherein the selecting means is adapted to select the mapping by optimising the mapping quality function as a function of the mapping parameters.

Claims 24-29 (cancelled).

30.   (New) A computer program or computer program product comprising software code adapted, when executed on a data processing apparatus, to perform a signal enhancement operation on a digital input signal represented by signal parameters, the operation comprising: processing the digital input signal to determine the optimal mapping between the signal parameters and a set of optimisation parameters; and utilising said optimal mapping in the signal enhancement operation; the optimal mapping being selected from a plurality of

candidate mappings in dependence on a measure of the quality of signal enhancement achievable by applying the signal enhancement operation to the digital input signal using a given candidate mapping.

31. (New) A computer program or computer program product according to claim 24, wherein the signal enhancement operation further comprises: determining the quality measure by evaluation of a mapping quality function of a set of mapping parameters; and obtaining an optimum mapping by optimisation of the mapping quality function as a function of the mapping parameters.

32. (New) A computer program or computer program product according to claim 25, wherein the mapping quality function is a Bayesian evidence function.